

Video Alignment

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Introduction

- Problem Statement
- Background
 - Image Alignment
 - Video Alignment
 - Synchronization
- Applications
 - Wide Screen Movies
 - High Security Areas

Spatio-Temporal Alignment

- Jointly Moving Sources
- Image Based Alignment
- Trajectory Based Alignment [Stein, 1998]
- Direct Method (MMSE) [Caspi and Irani, 2000 and 2002]
 - Hierarchical Approach [Bergen, *et.al.*, 1992]
 - Coarse-to-fine estimation using pyramids

Video Matching

- Jointly Moving Sources
- Best Frame-Pair Search
- Robust Image Registration
 - Rejection of Outlier Regions
- Statistical Approach
- Warp Matched Images [Sand & Teller, 2004]

Non-Overlapping Videos

- Jointly Moving Sources
- Similar frame to frame transformation [Caspi & Irani 2001]
- Planar or Distant (2D) Scenes
- 3D Scenes
- Synchronization
- Extension: Noisy Image Sequences [Spencer & Shah, 2004]

Implementation

- Assumptions
 - Non-Overlapping Synchronized Videos
 - Planar Scene (viewed from a distance)
 - Affine/Projective Transformation
- Learning Phase
 - Jointly Moving Sources
 - Recover Inter-Camera Transformation
- Free Camera Movement
 - Use Inter-Frame Transformation

Demonstration

